PCT/US 98/23547

```
=> d his full

     (FILE 'HOME' ENTERED AT 11:51:40 ON 28 JAN 1999)

     FILE 'CAPLUS' ENTERED AT 11:51:44 ON 28 JAN 1999
L1             69 SEA ELECTRODE# (2A) COMPLEMENT?

     FILE 'STNGUIDE' ENTERED AT 11:52:23 ON 28 JAN 1999
L2              0 SEA NANOELELECTRODE#
L3              0 SEA NANOELECTRODE#

     FILE 'CAPLUS' ENTERED AT 11:54:16 ON 28 JAN 1999

     FILE 'CAPLUS' ENTERED AT 11:54:19 ON 28 JAN 1999
L4             25 SEA NANOELECTRODE#

     FILE 'STNGUIDE' ENTERED AT 11:55:10 ON 28 JAN 1999
L5              0 S ELECTRODE# (2A) (SURFACE#)

     FILE 'CAPLUS' ENTERED AT 11:57:19 ON 28 JAN 1999
L6          21006 SEA ELECTRODE# (2A) (SURFACE# OR BIND? OR COMPLEMENT?)
L7            535 SEA L6 AND (DNA OR RNA OR NUCLEIC OR PROTEIN#)

     FILE 'STNGUIDE' ENTERED AT 11:58:38 ON 28 JAN 1999

     FILE 'CAPLUS' ENTERED AT 12:02:05 ON 28 JAN 1999

     FILE 'STNGUIDE' ENTERED AT 12:02:08 ON 28 JAN 1999

     FILE 'CAPLUS' ENTERED AT 12:05:46 ON 28 JAN 1999

     FILE 'STNGUIDE' ENTERED AT 12:05:47 ON 28 JAN 1999

     FILE 'CAPLUS' ENTERED AT 12:05:55 ON 28 JAN 1999

     FILE 'STNGUIDE' ENTERED AT 12:05:58 ON 28 JAN 1999
L8              0 SEA NANOSENSOR#

     FILE 'CAPLUS' ENTERED AT 12:07:40 ON 28 JAN 1999
L9             19 SEA NANOSENSOR#

     FILE 'STNGUIDE' ENTERED AT 12:07:54 ON 28 JAN 1999

     FILE 'CAPLUS' ENTERED AT 12:10:18 ON 28 JAN 1999

     FILE 'STNGUIDE' ENTERED AT 12:10:23 ON 28 JAN 1999

     FILE 'CAPLUS' ENTERED AT 12:10:41 ON 28 JAN 1999

     FILE 'STNGUIDE' ENTERED AT 12:10:42 ON 28 JAN 1999

     FILE 'CAPLUS' ENTERED AT 12:11:26 ON 28 JAN 1999

     FILE 'STNGUIDE' ENTERED AT 12:11:26 ON 28 JAN 1999
L10             0 SEA MOLECUL? RECOGNIT?

     FILE 'CAPLUS' ENTERED AT 12:13:03 ON 28 JAN 1999
```

```
L11          2993 SEA MOLECUL? RECOGNIT?
L12           314 S L11 AND (SENS? OR ELECTRODE# OR BIOSENS? OR MICROELECTRODE#)

     FILE 'STNGUIDE' ENTERED AT 12:15:00 ON 28 JAN 1999

     FILE 'CAPLUS' ENTERED AT 12:18:24 ON 28 JAN 1999

     FILE 'STNGUIDE' ENTERED AT 12:18:30 ON 28 JAN 1999

     FILE 'CAPLUS' ENTERED AT 12:21:45 ON 28 JAN 1999

     FILE 'STNGUIDE' ENTERED AT 12:21:45 ON 28 JAN 1999
```

```
=> d his full

     (FILE 'HOME' ENTERED AT 09:05:07 ON 28 JAN 1999)

     FILE 'CAPLUS' ENTERED AT 09:05:13 ON 28 JAN 1999
L1          8112 SEA ELECTRODE# (2A) (SHAPE# OR STRUCTURE# OR CONFORM? OR
                 COMPLEMENT? OR BIND?)

     FILE 'STNGUIDE' ENTERED AT 09:06:55 ON 28 JAN 1999

     FILE 'CAPLUS' ENTERED AT 09:07:48 ON 28 JAN 1999

     FILE 'STNGUIDE' ENTERED AT 09:07:49 ON 28 JAN 1999

     FILE 'CAPLUS' ENTERED AT 09:07:55 ON 28 JAN 1999

     FILE 'STNGUIDE' ENTERED AT 09:07:56 ON 28 JAN 1999

     FILE 'CAPLUS' ENTERED AT 09:08:01 ON 28 JAN 1999

     FILE 'STNGUIDE' ENTERED AT 09:08:02 ON 28 JAN 1999

     FILE 'CAPLUS' ENTERED AT 09:08:07 ON 28 JAN 1999

     FILE 'STNGUIDE' ENTERED AT 09:08:07 ON 28 JAN 1999
L2             0 SEA L1 AND (MOLECULE# OR PROTEIN# OR DNA OR RNA OR NUCLEIC)

     FILE 'CAPLUS' ENTERED AT 09:08:46 ON 28 JAN 1999
L3           138 SEA L1 AND (MOLECULE# OR PROTEIN# OR DNA OR RNA OR NUCLEIC)

     FILE 'STNGUIDE' ENTERED AT 09:09:43 ON 28 JAN 1999

     FILE 'CAPLUS' ENTERED AT 09:11:06 ON 28 JAN 1999

     FILE 'STNGUIDE' ENTERED AT 09:11:10 ON 28 JAN 1999

     FILE 'CAPLUS' ENTERED AT 09:13:09 ON 28 JAN 1999

     FILE 'STNGUIDE' ENTERED AT 09:13:10 ON 28 JAN 1999
L4             0 SEA NANOELECTRODE# OR NANOSENSOR# OR MICROELECTRODE#

     FILE 'CAPLUS' ENTERED AT 09:18:14 ON 28 JAN 1999
L5          9424 SEA NANOELECTRODE# OR NANOSENSOR# OR MICROELECTRODE#
L6            69 SEA L5 (2A) (SHAPE# OR STRUCTURE# OR CONFORM? OR COMPLEMENT?
                 OR BIND?)
L7            68 SEA L6 NOT L3

     FILE 'STNGUIDE' ENTERED AT 09:19:44 ON 28 JAN 1999

     FILE 'CAPLUS' ENTERED AT 09:20:42 ON 28 JAN 1999

     FILE 'STNGUIDE' ENTERED AT 09:20:42 ON 28 JAN 1999
L8             0 SEA L5 AND (MOLECULE# OR PROTEIN# OR DNA OR RNA OR NUCLEIC)

     FILE 'CAPLUS' ENTERED AT 09:21:22 ON 28 JAN 1999
L9           391 SEA L5 AND (MOLECULE# OR PROTEIN# OR DNA OR RNA OR NUCLEIC)
```

FILE 'STNGUIDE' ENTERED AT 09:22:18 ON 28 JAN 1999

FILE 'CAPLUS' ENTERED AT 09:22:50 ON 28 JAN 1999

FILE 'STNGUIDE' ENTERED AT 09:22:51 ON 28 JAN 1999

```
=> d his full

     (FILE 'HOME' ENTERED AT 14:47:17 ON 28 JAN 1999)

     FILE 'WPIDS' ENTERED AT 14:47:20 ON 28 JAN 1999
L1            1 SEA (NANOELECTRODE# OR NANOSENSOR#)

     FILE 'JAPIO' ENTERED AT 14:47:51 ON 28 JAN 1999
L2            0 SEA (NANOELECTRODE# OR NANOSENSOR#)
L3         2272 SEA (ELECTRODE# (2A) (SHAPE OR BIND? OR COMPLEMENT?))
L4            2 SEA L3 AND (DNA OR RNA OR NUCLEIC OR PROTEIN#)

     FILE 'WPIDS' ENTERED AT 14:49:13 ON 28 JAN 1999
L5            9 SEA L3 AND (DNA OR RNA OR NUCLEIC OR PROTEIN#)

     FILE 'STNGUIDE' ENTERED AT 14:50:31 ON 28 JAN 1999

     FILE 'WPIDS' ENTERED AT 14:50:54 ON 28 JAN 1999

     FILE 'STNGUIDE' ENTERED AT 14:50:57 ON 28 JAN 1999
L6            0 SEA NANOSCALE ELECTRODE#

     FILE 'JAPIO' ENTERED AT 14:52:01 ON 28 JAN 1999
L7            0 SEA NANOSCALE ELECTRODE#
L8            3 SEA ELECTRODE (2A) NANO?

     FILE 'WPIDS' ENTERED AT 14:52:36 ON 28 JAN 1999
L9           26 SEA ELECTRODE (2A) NANO?

     FILE 'STNGUIDE' ENTERED AT 14:53:52 ON 28 JAN 1999

     FILE 'WPIDS' ENTERED AT 14:54:00 ON 28 JAN 1999

     FILE 'STNGUIDE' ENTERED AT 14:54:07 ON 28 JAN 1999

     FILE 'WPIDS' ENTERED AT 14:55:18 ON 28 JAN 1999

     FILE 'STNGUIDE' ENTERED AT 14:55:20 ON 28 JAN 1999

     FILE 'JAPIO' ENTERED AT 14:55:47 ON 28 JAN 1999
L10           3 SEA ELECTRODE (2A) NANO?

     FILE 'CAPLUS' ENTERED AT 14:56:04 ON 28 JAN 1999
L11         232 SEA ELECTRODE (2A) NANO?

     FILE 'STNGUIDE' ENTERED AT 14:56:47 ON 28 JAN 1999

     FILE 'CAPLUS' ENTERED AT 14:57:34 ON 28 JAN 1999

     FILE 'STNGUIDE' ENTERED AT 14:57:40 ON 28 JAN 1999
```

L9 ANSWER 1 OF 26 WPIDS
AN 98-388280 [33] WPIDS
DNN N98-302689 DNC C98-117604
TI Miniaturised device for detecting analyte based on impedance measurements - between electrodes spaced few nanometres apart, provides high sensitivity and specificity in assays of, e.g. antigens for diagnosis of infectious disease.
DC B04 D16 J04 S03
IN CLERC, J F; MASSIT, C; CLERC, J
PA (COMS) COMMISSARIAT ENERGIE ATOMIQUE
CYC 19
PI WO 9829740 A1 980709 (9833)* FR 35 pp G01N027-327
RW: AT BE CH DE DK ES FI FR GB GR IE IT LU MC NL PT SE
W: JP US
FR 2757949 A1 980703 (9833) G01N027-02
ADT WO 9829740 A1 WO 97-FR2440 971229; FR 2757949 A1 FR 96-16201 961230
PRAI FR 96-16201 961230
IC ICM G01N027-02; G01N027-327
ICS G01N033-483; G01N033-543; H05K003-06
AB WO 9829740 A UPAB: 980819
Device for detecting an analyte (I) comprises: (i) an insulating support (1), coated with a first conductor (3), forming a first electrode, and with second conductor (5) supporting several conducting elements (7) that extend above (3) to form a second, coplanar electrode positioned at a distance, d, from (3), and (ii) a system (13, 15) for polarising the conductors.

USE - The microdevice is particularly used for biological analysis, e.g. clinically, in agriculture and for environmental monitoring, particularly for in vitro detection of infectious agents (human immune deficiency virus or mycobacteria). Generally (I) is an antigen, antibody, hapten, peptide, nucleic acid, enzyme or enzyme substrate.

ADVANTAGE - Compared with known systems, this device has a much smaller distance between electrodes, so sensitivity is improved. Also size is reduced, response is rapid and since electrode area is high, the signal to noise ratio is increased. Several devices of the same type can be mounted on the same chip to increase specificity (no interference from local contaminants, or non-specific binding), while miniaturisation reduces costs.
Dwg.1/17
FS CPI EPI
FA AB; GI; DCN
MC CPI: B04-B04C; B04-C01; B04-E01; B04-F10B2; B04-F11; B04-L01; B04-N04; B11-C08B; B12-K04A; D05-H09; J04-B01
EPI: S03-E03C; S03-E14H4

L9 ANSWER 4 OF 26 WPIDS
AN 97-386034 [36] WPIDS
DNN N97-321348 DNC C97-123949
TI Ultra micro **nanometre electrode** and ultra micro sensor.
DC J04 S03
IN ZHANG, W; ZHANG, X; ZHOU, X
PA (UYWU-N) UNIV WUHAN
CYC 1

PI CN 1110786 A 951025 (9736)* G01N027-30
ADT CN 1110786 A CN 94-104755 940429
PRAI CN 94-104755 940429
IC ICM G01N027-30
AB CN 1110786 A UPAB: 970909

Ion beam etching technique is used to make up electrode with minimal size of 30 nm. The electrode features controllable size, molecule- class surface smoothness and high mechanical strength, so it maybe used for measuring in single cell. A voltol insulating method is disclosed to make up nm-class disk electrode with excellent electrochemical performance.
The
electrode and its supporter are sealed in vacuum to avoid pollution. The nm-class ultramicro pH sensor is made up by chemical trimming of said electrode.

FS CPI EPI
FA AB
MC CPI: J04-C02
EPI: S03-E03

```
L3   ANSWER 11 OF 138  CAPLUS  COPYRIGHT 1999 ACS
AN   1997:625648  CAPLUS
DN   127:313737
TI   Detection of molecules and molecule complexes
IN   Hintsche, Rainer; Paeschke, Manfred
PA   Fraunhofer Gesellschaft Zur Forderung Der Angewandten Forschung E.V.,
     Germany; Hintsche, Rainer; Paeschke, Manfred
SO   PCT Int. Appl., 24 pp.
     CODEN: PIXXD2
DT   Patent
LA   German
IC   ICM  G01N027-12
     ICS  G01N033-543
CC   76-2 (Electric Phenomena)
     Section cross-reference(s): 3, 9
FAN.CNT 1
     PATENT NO.       KIND  DATE          APPLICATION NO.  DATE
     ---------------  ----  --------      ---------------  --------
PI   WO 9734140        A1   19970918      WO 97-DE494      19970312
         W:  JP, US
         RW: AT, BE, CH, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT,
SE
     DE 19610115       A1   19970918      DE 96-19610115   19960314
     EP 886773         A1   19981230      EP 97-919270     19970312
         R:  DE, FR, GB
PRAI DE 96-19610115   19960314
     WO 97-DE494      19970312
AB   A process for detecting mols. or mol. complexes is described in which a
     measurement probe is brought into contact with an ultra-microelectrode
     arrangement comprising at least two electrode structures
     configured in such a way that the distances between the different
     structures lie in the ultra-micro range; an alternating elec. field is
     created by application of an elec. potential; and the current or
potential
     fluctuations caused by the species present or created in the measurement
     probe are measured.  The process is esp. useful for detecting large mol.
     complexes from immunoproteins or DNS mols.
ST   detection large mols complexes app
IT   Electrochemical sensors
     Glass electrodes
     Nucleic acid hybridization
        (detection of mols. and mol. complexes)
IT   DNA
     RNA
     RL: ARU (Analytical role, unclassified); ANST (Analytical study)
        (detection of mols. and mol. complexes)
IT   Ceramics
        (electrodes; detection of mols. and mol. complexes)
IT   Polymers, uses
     RL: TEM (Technical or engineered material use); USES (Uses)
        (electrodes; detection of mols. and mol. complexes)
IT   58-85-5D, Biotin, thiol derivs.   5094-33-7, p-Aminophenyl-.beta.-D-
     galactopyranoside   9013-20-1, Streptavidin
     RL: ARU (Analytical role, unclassified); ANST (Analytical study)
        (detection of mols. and mol. complexes)
```

7
|

IT 7439-88-5, Iridium, uses 7440-06-4, Platinum, uses 7440-57-5, Gold, uses 7631-86-9, Silica, uses
RL: TEM (Technical or engineered material use); USES (Uses)
(electrodes; detection of mols. and mol. complexes)

L3 ANSWER 20 OF 138 CAPLUS COPYRIGHT 1999 ACS
AN 1997:40046 CAPLUS
DN 126:141563
TI Modified monolayer electrodes for electrochemical and piezoelectric analysis of substrate-receptor interactions: novel immunosensor electrodes
AU Cohen, Yael; Levi, Shlomo; Rubin, Shai; Willner, Itamar
CS Inst. Chem., Hebrew Univ. Jerusalem, Jerusalem, 91904, Israel
SO J. Electroanal. Chem. (1996), 417(1-2), 65-75
CODEN: JECHES; ISSN: 0368-1874
PB Elsevier
DT Journal
LA English
CC 9-1 (Biochemical Methods)
AB Monolayer-modified Au-electrodes were used to analyze electrochem. host-guest binding interactions of biomaterials. Two configurations to sense the binding of an antibody and a lectin to the complementary substrate monolayer are addressed. In one configuration, a fluorescein monolayer was assembled on an Au-**electrode** and **binding** of the complementary anti-fluorescein antibody Flc-Ab was followed by the examn. of electrode insulation by the antibody towards a solubilized redox probe, Fe(CN)63-/Fe(CN)64-. The extent of electrode insulation is controlled by the Flc-Ab concn. in the sample and the electrode responds amperometrically to Flc-Ab concns. as low as 0.7.mu.M. The second configuration applies a redox-modified **protein** to analyze competitively the **protein** itself. An Au-electrode was modified by an .alpha.-D-mannopyranose monolayer, and a bipyridinium-modified Con A was used to analyze Con A (Con. A). Competitive binding of the redox-modified Con. A and the analyzed Con. A to the monolayer-modified electrode occurred, and the amperometric response was inversely proportional to the Con. A concn. Quartz crystals coated with Au-electrodes were applied for the piezoelec. QCM analyses of Flc-Ab and Con. A. The crystal electrodes are modified with a fluorescein antigen monolayer. The Flc-Ab was sensed by the changes in the crystal frequencies as a result of the antibody assocn. to the electrode. Flc-Ab at a concn. as low as 5 ng ml-1 was detected. The series of monosaccharides .alpha.-D-mannopyranose, .beta.-D-glucose or .alpha.-D-glucose was assembled onto the Au-electrodes of the quartz crystals and used as a sensing interface for Con A. The .alpha.-D-mannopyranose monolayer revealed high affinity for the binding of Con. A, whereas the .beta.-D-glucose monolayer showed lower affinity for the **protein**, and the .alpha.-D-glucose monolayer lacked assocn. to Con. A. The monolayer-modified quartz crystal electrodes revealed specificity for the resp. complementary **proteins**.
ST monolayer electrode electrochem piezoelec analysis; substrate receptor interaction immunosensor
IT Electrodes
Immunosensors
Proteins (general), analysis
RL: ANT (Analyte); ANST (Analytical study)
(modified monolayer electrodes for electrochem. and piezoelec. anal. of substrate-receptor interactions)
IT Antibodies
RL: ARG (Analytical reagent use); ANST (Analytical study); USES (Uses)
(modified monolayer electrodes for electrochem. and piezoelec. anal. of substrate-receptor interactions)

IT Lectins
RL: ARG (Analytical reagent use); ANST (Analytical study); USES (Uses)
(modified monolayer electrodes for electrochem. and piezoelec. anal.
of
substrate-receptor interactions)
IT Crystal structure types
RL: ANT (Analyte); ANST (Analytical study)
(quartz; modified monolayer electrodes for electrochem. and piezoelec.
anal. of substrate-receptor interactions)
IT 2321-07-5, Fluorescein 7296-15-3, .alpha.-D-Mannopyranose 11028-71-0,
Concanavalin A 13408-62-3 13408-63-4 71990-44-8, Bipyridinium
RL: ARG (Analytical reagent use); ANST (Analytical study); USES (Uses)
(modified monolayer electrodes for electrochem. and piezoelec. anal.
of
substrate-receptor interactions)
IT 7440-57-5, Gold, uses
RL: DEV (Device component use); USES (Uses)
(modified monolayer electrodes for electrochem. and piezoelec. anal.
of
substrate-receptor interactions)

AN 1995:825387 CAPLUS
DN 123:269179
TI Influence of the crystallographic **structure** of the
electrode surface on the structure of the electrical double layer
and adsorption or organic **molecules**
AU Lust, E. J.; Lust, K. K.; Janes, A. A.-J.
CS Tartu Univ., Tartu, Russia
SO Russ. J. Electrochem. (Transl. of Elektrokhimiya) (1995), 31(8), 807-21
CODEN: RJELE3; ISSN: 1023-1935
DT Journal
LA English
CC 72-2 (Electrochemistry)
Section cross-reference(s): 66, 75
AB Results of a systematic investigation on the influence of the crystallog.
structure of the surface of Bi, Sb, and Cd electrodes on the regularities
of the structure of the elec. double layer in aq. and nonaq. solns. of
surface-inactive electrolytes are reported. The way in which
characteristics of the electrode surface affect the adsorption behavior
of
various org. mols. was studied. General regularities describing the
effect of the chem. nature and the crystallog. structure of the surface
on
the structure of the elec. double layer and adsorption of org. compds.
were found.
ST crystallog **structure electrode** surface; elec double
layer adsorption org mol
IT Electric potential
(-capacitance; elec. potential vs. capacitance of adsorbed org. mols.
on metals)
IT Adsorption
Crystal **structure**
Electrodes
(**electrode** surface crystallog. **structure** effect on
elec. double layer structure and adsorption or org. mols.)
IT Solvent effect
(solvent effect on elec. double layer structure of metals and
adsorption or org. mols.)
IT Electric double layer
(**structure**; **electrode** surface crystallog.
structure effect on elec. double layer structure and adsorption
or org. mols.)
IT 7440-36-0, Antimony, properties
RL: PRP (Properties)

(surface crystallog. structure effect of antimony on elec. double
layer
structure and adsorption or org. mols.)

IT 7440-69-9, Bismuth, properties
RL: PRP (Properties)
(surface crystallog. structure effect of bismuth on elec. double layer
structure and adsorption or org. mols.)

IT 7440-43-9, Cadmium, properties
RL: PRP (Properties)
(surface crystallog. structure effect of cadmium on elec. double layer
structure and adsorption or org. mols.)

L3 ANSWER 30 OF 138 CAPLUS COPYRIGHT 1999 ACS

AN 1995:646864 CAPLUS

DN 123:51350

TI Fabrication and characterization of a nanosensor for admittance
spectroscopy of biomolecules

AU Montelius, Lars; Tegenfeldt, Jonas O.; Ling, Torbjoern G. I.

CS Dep. of Solid State Physics, Lund Univ., Lund, 22100, Swed.

SO J. Vac. Sci. Technol., A (1995), 13(3, Pt. 2), 1755-60
CODEN: JVTAD6; ISSN: 0734-2101

DT Journal

LA English

CC 9-1 (Biochemical Methods)

AB The authors have fabricated nanometer-sized interdigitated electrode
patterns using electron beam lithog. and liftoff techniques. The aim of
the investigation was to find out whether the dimensions (i.e., the
electrode sepns.) of the pattern would ffect the admittance signal of the
biomols. in between the electrodes. Since the admittance signal scales
with the geometrical factor A/d, where A is the electrode area and d is
the sepn., the authors chose to keep A/d const. when changing the
electrode sepn. to eliminate this trivial effect on the admittance
signal.
An interdigitated **electrode structure** having an
electrode spacing in the nanometer regime makes it possible to
reach high nonstationary as well as stationary elec. field strengths
while
have a low applied voltage level. Hence, electrode reactions will be as
small as possible, while a high signal to noise ratio is obtained. The
authors have been able to exptl. study the response of the impedance
behavior to high elec. fields exhibiting either a pos. or a neg. shift of
the premittivity as a function of the field being a high
alternating-current or a direct-current field, resp.

ST fabrication characterization nanosensor admittance spectroscopy biomol

IT Spectrometry
(admittance; fabrication and characterization of a nanosensor for
admittance spectroscopy of biomols.)

IT Electrodes
(fabrication and characterization of a nanosensor for admittance
spectroscopy of biomols.)

IT **Molecules**
(biochem., fabrication and characterization of a nanosensor for
admittance spectroscopy of biomols.)

L14 ANSWER 1 OF 1 WPIDS

AN 97-458814 [43] WPIDS

DNN N97-382004

TI Molecules and molecular complexes detection for biotechnology - involves bringing measurement specimen in contact with ultra-microelectrode arrangement, generating alternating electrical field with electrical potential, measuring current or voltage changes.

DC S03

IN HINTSCHE, R; PAESCHKE, M

PA (FRAU) FRAUNHOFER GES FOERDERUNG ANGEWANDTEN

CYC 19

PI DE 19610115 A1 970918 (9743)* 7 pp G01N027-02
WO 9734140 A1 970918 (9743) G01N027-12 <--
RW: AT BE CH DE DK ES FI FR GB GR IE IT LU MC NL PT SE
W: JP US

ADT DE 19610115 A1 DE 96-19610115 960314; WO 9734140 A1 WO 97-DE494 970312

PRAI DE 96-19610115 960314

REP 2.Jnl.Ref ; DE 3228542; EP 299780; US 5491097; WO 9429708

IC ICM G01N027-02; G01N027-12
ICS G01N027-327; G01N033-543

AB DE19610115 A UPAB: 971030

The method involves bringing a measurement specimen in contact with an ultra-microelectrode arrangement containing at least two electrode structures which are arranged w.r.t. each other so that the distances between the different structures lie in the ultra-micro-range of molecules in thin-section molecules.

An alternating electrical field is generated by applying an electrical potential. The current or potential variations caused in the measurement specimen are measured. Field variations are measured using impedance spectroscopy.

USE/ADVANTAGE - For measurements in health e.g. biotin, complexes, immunology e.g. haptens. For environment, chemical industry. Enables higher sensitivity detection at relatively low system costs.

Dwg.2/4

FS EPI

FA AB; GI

M

L2 ANSWER 11 OF 15 CAPLUS COPYRIGHT 1999 ACS
AN 1998:103629 CAPLUS
DN 128:186926
TI Metallic nanowires: conductance statistics, stability, IV curves, and magnetism
AU Costa-Kramer, J. L.; Garcia, N.; Garcia-Mochales, P.; Marques, M. I.; Serena, P. A.
CS Laboratorio de Fisica de Sistemas Pequenos y Nanotecnologia, CSIC, Madrid,
E-28006, Spain
SO NATO ASI Ser., Ser. E (1997), 340(Nanowires), 171-190
CODEN: NAESDI; ISSN: 0168-132X
PB Kluwer Academic Publishers
DT Journal
LA English
CC 76-1 (Electric Phenomena)
Section cross-reference(s): 77
AB Conductance quantization (CQ) in three dimensional nanowires is a phenomenon with fundamental and technol. significance, particularly in the
area of miniaturized electronic devices. Up to date, even with careful controlled conditions, it was not possible to reproduce exactly the current evolution on breaking a metallic nano contact. This is due to the
deformation mechanisms of the nano contact. It was argued that to prove CQ, a statistical study including several conductance expts. has to be performed. However, some criteria was always used to select the conductance curves with which the **nanowire** conductance histogram is built. To prove the quantized nature of the conductance in these nanostructures at room temp. (RT) the authors have performed a statistical
study using tens of thousands of consecutive nano contact breaking conductance curves to build the conductance histogram for different metallic junctions. This is at least 100 times more samples than any previous study, and without sample selection. The expt. was performed at RT and ambient conditions in a Scanning Tunneling Microscope (STM), where a tip is crashed repeatedly into the surface, measuring the conductance of
the breaking contact and building its histogram in real time. The remarkable reproducibility of the CQ histograms obtained this way allows the study of the effect of applied bias. **electrode** sepn. speed, etc. on the histograms. Notably, clear conductance peaks are obsd. in these massive histograms for Au, Ag, Cu, Na and, Pt nano contacts at RT, with the 1st peak centered always at a slightly lower value than 1 G0 = 2e2/h. The small deviations of the CQ peaks from the value nG0=n2e2/h (corresponding to a perfectly ordered **nanowire**) in these diamagnetic nanowires are attributed to disorder, behaving effectively for
Au like a resistance in series with the contact. Exptl. and theor. results supporting this view are presented. The same expt. with ferromagnetic electrodes produces no peaks in the histogram, even though the measured conductance curves exhibit a stepped behavior. This observation is most probably due to the lifting of the spin degeneracy due
to the ferromagnetic character of the electrodes. The authors have studied the stability of Au nanocontacts in an Ultra High Vacuum (UHV) environment, finding remarkable stability and using this fact to measure the current-voltage characteristics (IV) with high accuracy. A pos.

nonlinear contribution to the conductance is found in the IV characteristics. This contribution is roughly independent of the quantum conductance channel and its origin is not clear yet.

ST quantization cond metal **nanowire**; magnetism metal **nanowire**; copper **nanowire** quantization cond; silver **nanowire** quantization cond; sodium **nanowire** quantization cond; gold **nanowire** quantization cond

IT Wire
(**nanowire**; quantization of cond. and magnetism in metal nanowires)

IT Nanostructures
(nanowires; quantization of cond. and magnetism in metal nanowires)

IT Electric conductivity
Magnetism
Quantization
(quantization of cond. and magnetism in metal nanowires)

IT Metals, properties
RL: PEP (Physical, engineering or chemical process); PRP (Properties); TEM
(Technical or engineered material use); PROC (Process); USES (Uses)
(quantization of cond. and magnetism in metal nanowires)

IT 7440-22-4, Silver, properties 7440-23-5, Sodium, properties 7440-50-8,
Copper, properties 7440-57-5, Gold, properties
RL: PEP (Physical, engineering or chemical process); PRP (Properties); TEM
(Technical or engineered material use); PROC (Process); USES (Uses)

L3 ANSWER 3000 OF 6614 CAPLUS COPYRIGHT 1999 ACS
AN 1995:379715 CAPLUS
DN 122:155498
TI Improved methods for structural studies of **proteins** using nuclear magnetic resonance spectroscopy
AU Clowes, Robin T.; Crawford, Arthur; Raine, Andrew R. C.; Smith, Brian O.; Laue, Ernest D.
CS Univ. Cambridge, Cambridge, UK
SO Curr. Opin. Biotechnol. (1995), 6(1), 81-8
CODEN: CUOBE3; ISSN: 0958-1669
DT Journal
LA English
CC 9-5 (Biochemical Methods)
AB The past few years have seen the development of three- and four-dimensional heteronuclear **NMR** methods. Increased sophistication in labeling strategies, use of pulse-field gradients and the application of these methods at higher magnetic fields has, in combination with improved software, allowed studies of the structure, interactions and dynamics of significantly larger **proteins** (now up to .apprx.270 amino acid residues).
ST **conformation protein NMR** spectroscopy
IT **Conformation** and Conformers
Nuclear magnetic resonance spectrometry
(improved methods for structural studies of **proteins** using **NMR** spectroscopy)
IT **Proteins**, properties
RL: PRP (Properties)
(improved methods for structural studies of **proteins** using **NMR** spectroscopy)